

# Kathryn M. Stack Morgan

Curriculum Vitae

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## EDUCATION

- Ph.D.**, 2015, California Institute of Technology, Division of Geological and Planetary Sciences,  
Geology (advisor, J. Grotzinger)
- M.Sc.** 2011, California Institute of Technology, Division of Geological and Planetary Sciences,  
Geology (advisor, J. Grotzinger)
- B.A.** cum laude, 2008, Williams College (advisor: Bud Wobus)  
Majors: Geosciences (with honors), Astronomy

## Additional Training:

- 2017 JPL Innovation Foundry Scientist Mission Interface Workshop 3
- 2012 GSA/ExxonMobil Big Horn Basin Field Course, Cody, WY
- 2010 Agouron Institute Advanced Geobiology Field Course, Southern Spain
- 2010 Caltech Carbonate Sedimentology Short Course
- 2008 University of Houston-Yellowstone Bighorn Research Association Geology Field Camp,  
Red Lodge, MT

## PROFESSIONAL EXPERIENCE

- 2017-present Deputy Project Scientist, Mars 2020 Rover Mission
- 2016-present Participating Scientist, Mars Science Laboratory
- 2014-present Research Scientist, Jet Propulsion Laboratory, California Institute of Technology,  
Geophysics and Planetary Geosciences Group
- 2012-2015 Collaborator, Science Office, Mars Science Laboratory

## AWARDS AND HONORS

- 2017 NASA Group Achievement Award, MSL Extended Mission-1 Science and Operations Team
- 2016 Mars Exploration Directorate Team Award
- 2015 NASA Group Achievement Award, MSL Prime Mission Science and Operations Team
- 2015 Mars Science Laboratory JPL Voyager Award
- 2013 Forbes 30 Under 30 in Science and Healthcare
- 2013 Finalist for MIT Technology Review Innovators Under 35

- 2013 NASA Group Achievement Award, MSL Science Office Development and Operations Team
- 2012 Caltech Division of Geological and Planetary Sciences Jahns Teaching Prize
- 2012 GSA/ExxonMobil Bighorn Basin Field Award
- 2008 Mineralogical Society of America's American Mineralogist Undergraduate Award
- 2008 Williams College Freeman Foot Prize in Geology

## GRANTS AND FELLOWSHIPS

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|----------------|---|
| 2018-2020      | <b>Co-I</b> , Strategic Initiative Proposal for the Research and Technology Development Fund, JPL, "MAARS: Machine learning-based Analytics for Autonomous Rover Systems" (PI: Hiro Ono)            |
| 2017-2019      | <b>Co-I</b> , NASA ROSES 2016 Mars Data Analysis Program, "Understanding the Geologic Setting and Depositional Environments of Sedimentary Iron Oxide Deposits On Mars" (PI: Abigail Fraeman, JPL)  |
| 2017-2019      | <b>Co-I</b> , NASA Innovative Advanced Concepts (NIAC) II, "Automaton Rover for Extreme Environments" (PI: Jonathan Sauder, JPL)  |
| 2016-2019      | <b>PI</b> , NASA ROSES 2015 MSL Participating Scientist Program, "Orbital and In Situ Stratigraphic Analysis of Lower Mount Sharp, Gale Crater"   |
| 2015-2018      | <b>PI</b> , Strategic Initiative Proposal for the Research and Technology Development Fund, JPL, "Correlating Ancient Sedimentary Environments in the Rock Record of Early Mars"                    |
| 2011           | ExxonMobil Geoscience Grant   |
| 2010           | Mars Exploration Program Student Travel Grant   |
| 2007           | NSF-REU Keck Geology Consortium Fellowship  |
| 2006           | NSF-REU Keck Northeast Astronomy Consortium Fellowship  |
| <b>Pending</b> |   |
| 2018-2021      | <b>Co-I (JPL Lead)</b> , NASA ROSES 2017 Planetary Science and Technology Through Analog Research (PSTAR), "RAVEN, Rover-Aerial Vehicle Exploration and Navigation" (PI: Christopher Hamilton, ASU) |
| 2018-2021      | <b>PI</b> , NASA ROSES 2017 Mars Data Analysis Program, "Assessing the Formation Environments of Hydrated Silica on Mars" (Science PI: Vivian Sun, JPL)   |

## PEER REVIEWED PUBLICATIONS

### In Review or Submitted

- 34. Rivera-Hernández, F., D.Y. Sumner, N. Mangold, **K.M. Stack**, O. Forni, H. Newsom, A. Williams, M. Nachon, J. L'Haridon, O. Gasnault, R. Wiens, S. Maurice, "Using ChemCam LIBS data to constrain grain size in rocks on Mars: Proof of concept and application to rocks at Yellowknife Bay and Pahrump Hills, Gale crater," in review at *Icarus*.
- 33. Watkins, J., J.P. Grotzinger, N.T. Stein, S.G. Banham, S. Gupta, D.M. Rubin, **K. Stack Morgan**, K.S. Edgett, J. Frydenvang, K.L. Siebach, M.P. Lamb, D.Y. Sumner, K.W. Lewis, "Geometry and significance of an erosional unconformity on Mars, basal Stimson formation, Gale crater," in review at *J. Geophys. Res.-Planets*.

32. Stein, N., J.P. Grotzinger, J. Schieber, N. Mangold, B. Hallet, H. Newsom, **K.M.. Stack**, J.A. Berger, L. Thompson, K.L. Siebach, A. Cousin, S. Le Mouelic, M. Minitti, D.Y. Sumner, C. Fedo, C.H. House, S. Gupta, A.R. Vasavada, R. Gellert, R.C.. Wiens, J. Frydenvang, O. Forni, P.Y. Meslin, V. Payre, E. Dehouck, “Desiccation Cracks Provide Evidence of Lake Drying on Mars, middle Murray formation, Gale Crater, Mars,” in review at *Geology*.

#### Accepted and Published

31. **STACK, K.M.**, C.S. Edwards, J.P. Grotzinger, S. Gupta, D.Y. Sumner, F.J. Calef, III, L.A. Edgar, K.S. Edgett, A.A. Fraeman, S.R. Jacob, L.L. Le Deit, K.W. Lewis, M.S. Rice, D. Rubin, R.M.E. Williams, K.H. Williford (2016). Comparing orbiter and rover image-based mapping of an ancient sedimentary environment, Aeolis Palus, Gale crater, Mars, *Icarus*, Special Issue: MicroMars to MegaMars, doi:10.1016/j.icarus.2016.02.024.
30. **STACK, K.M.** and R.E. Milliken (2015). Reflectance spectroscopy of clay-sulfate Mixtures and implications for quantifying hydrated minerals on Mars, *Icarus*, 250, 332-356, doi:10.1016/j.icarus.2014.12.009.
29. **STACK, K.M.**, J.P. Grotzinger, L.C. Kah, M.E. Schmidt, N. Mangold, K.S. Edgett, D.Y. Sumner, K.L. Siebach, M. Nachon, R. Lee, D.L. Blaney, L.P. Deflores, L.A. Edgar, A.G. Fairén, L.A. Leshin, S. Maurice, D.Z. Oehler, M.S. Rice, R.C. Wiens (2014). Diagenetic origin of nodules in the Sheepbed member, Yellowknife Bay formation, Gale Crater, Mars, *J. Geophys. Res.*, doi:10.1002/2014JE004617.
28. **STACK, K.M.**, J.P. Grotzinger, R.E. Milliken (2013). Bed Thickness Distributions on Mars: An Orbital Perspective, *J. Geophys. Res.*, 118(6), 1323-1349.
27. BANHAM, S.G., S. Gupta, D. Rubin, J.A. Watkins, D.Y. Sumner, K.S. Edgett, J.P. Grotzinger, K.W. Lewis, L.A. Edgar, **K.M. Stack-Morgan**, R. Barnes, J.F. Bell III, M.D. Day, R.C. Ewing, M.G.A. Lapotre, N.T. Stein, F. Rivera-Hernandez, A. Vasavada (2018), “Ancient Martian Aeolian processes and palaeomorphology reconstructed from the Stimson formation on the lower slope of Aeolis Mons, Gale crater,” *Sedimentology*.
26. WILLIAMS, R.M.E., M.C. Malin, **K.M. Stack**, D.M. Rubin (2018), Assessment of Aeolis Palus Assessment of Aeolis Palus stratigraphic relationships based on bench-forming strata in the Kylie and the Kimberley Regions of Gale Crater, Mars, *Icarus*, 309, 84-104, doi:10.1016/j.icarus.2018.02.028.
25. EDGAR, L.A., S. Gupta, D.M. Rubin, K.W. Lewis, G.A. Kocurek, R.B. Anderson, J.F. Bell III, G Dromart, KS Edgett, JP Grotzinger, C Hardgrove, LC Kah, R Leveille, MC Malin, N Mangold, R.E. Milliken, M. Minitti, M. Palucis, M. Rice, S.K. Rowland, J. Schieber, **K.M. Stack**, D.Y. Sumner, R.M.E. Williams (2018), Shaler: in situ analysis of a fluvial sedimentary deposit on Mars, *Sedimentology*, 65(1), 96-122, doi:10.1111/sed.12370.
24. WIENS, R., D. Rubin, W. Goetz, A Fairén, S. Schwenzer, J. Johnson, B.. Clark, N Mangold, R. Milliken, **K. Stack Morgan**, D. Oehler, S. Rowland, M. Chan, D.. Vaniman, S Maurice, O. Gasnault, W. Rapin, S. Schroeder, S. Clegg, O. Forni, D. Blaney, A. Cousin, V. Payre, C. Fabre, M. Nachon, S. Le Mouelic, V. Sautter, S. Johnstone, F. Calef, A. Vasavada, J. Grotzinger (2017), Centimeter to Decimeter Hollow Concretions and Voids in Gale Crater Sediments, Mars, *Icarus*, doi:10.1016/j.icarus.2017.02.003.
23. HUROWITZ, J.A., J.P. Grotzinger, W.W. Fischer, R.E. Milliken, E. Dehouck, A.G. Fairén, J. Fydveng, R. Gellert, S. Gupta, S.M. McLennan, E.B. Rampe, K. Siebach, **K. Stack Morgan**, N. Stein, D.Y. Sumner, A.R.. Vasavada, R.C. Wiens (2017), Redox stratification of an ancient lake in Gale crater, Mars, *Science*, doi:10.1126/science.aah6849.

22. RICE, M.S., S. Gupta, A.H. Treiman, **K.M. Stack**, F. Calef, L.A. Edgar, J. Grotzinger, N. Lanza, L. Le Deit, J. Lasue, K.L. Siebach, A.. Vasavada, R.C. Wiens, J. Williams (2016), Geologic Overview of the Mars Science Laboratory Rover Mission at The Kimberley, Gale Crater, Mars, *JGR-Planets*, doi:10.1002/2016JE005200.
21. BRISTOW, T.F., R.M. Haberle, D.F. Blake, D. Des Marais, J.L. Eigenbrode, A.G. Fairén, J.P. Grotzinger, **K.M. Stack**, M.A. Mischna, E.B. Rampe, K.L. Siebach, B. Sutter, D.T. Vaniman, A.R. Vasavada (2016), Low Hesperian  $P_{CO_2}$  constrained from in situ mineralogical analysis at Gale crater, Mars, *PNAS*, doi:10.1073/pnas.1616649114.
20. EHLMANN, B.L., F.S. Anderson, J. Andrews-Hanna, J. Carter, D.C. Catling, P.R. Christensen, B.A. Cohen, C.D. Dressing, C.S. Edwards, L.T. Elkins-Tanton, K.A. Farley, C.I. Fassett, W.W. Fischer, A.A. Fraeman, M.P. Golombek, V.E. Hamilton, A.G. Hayes, C.D.K. Herd, B. Horgan, R. Hu, B.M. Jakosky, J.R. Johnson, J.F. Kasting, L. Kerber, K.M. Kinch, E.S. Kite, H.A. Knutson, J.I. Lunine, P.R. Mahaffy, N. Mangold, F.M. McCubbin, J.F. Mustard, P.B. Niles, C. Quantin-Nataf, M.S. Rice, **K.M. Stack**, D.J. Stevenson, S.T. Stewart, M.J. Toplis, T. Usui, B.P. Weiss, S.C. Werner, R.D. Wordsworth, J.J. Wray, R.A. Yingst, Y.L. Yung, K.J. Zahnle (2016), The Sustainability of Habitability on Terrestrial Planets: Insights, Questions, and Needed Measurements from Mars for Understanding the Evolution of Earth-like Worlds, *JGR-Planets 25<sup>th</sup> anniversary special issue*, doi:10.1002/2016JE005134.
19. NACHON M., N. Mangold, O. Forni, L.C .Kah, A. Cousin, R.C. Wiens, R. Anderson, D. Blaney, J.B. Blank, F. Calef, S.M. Clegg, C. Fabre, M.R. Fisk, O. Gasnault, J.P. Grotzinger, R. Konyak, N.L. Lanza, J. Lasue, L. Le Deit, S. Le Mouelic, P.-Y. Meslin, D.Z. Oehler, V. Payre, W. Rapin, S. Schorder, **K. Stack**, D. Sumner (2016), Chemistry of diagenetic features analyzed by ChemCam at Pahrump Hills Gale crater, Mars, *Icarus*, 281, 121-136, doi:10.1016/j.icarus.2016.08.026.
18. LITVAK, M.L., I.G. Mitrofanov, C. Hardgrove, **K.M. Stack**, A.B. Sanin, D. Lisov, W.V. Boynton, F. Fedosov, D. Golovin, K. Harshman, I. Jun, A.S. Kozyrev, R.O. Kuzmin, A. Malakhov, R. Milliken, M. Mischna, J. Moersch, M. Mokrousov, S. Nikiforov, R. Starr, C. Tate, V.I. Tret'yakov, A. Vostrukhin (2016), Hydrogen and chlorine abundances in the Kimberley formation of Gale crater measured by the DAN instrument onboard the Mars Science Laboratory Curiosity Rover, *J. Geophys. Res.-Planets*, 121(5), doi:10.1002/2015JE004960.
17. LE DEIT, L.C., N. Mangold, O. Forni, A. Cousin, J. Lasue, S. Schroder, R.C.. Wiens, D Sumner, C. Fabre, **K.M. Stack**, R.B. Anderson, D. Blaney, S. Clegg, G. Dromart, M. Fisk, O. Gasnault, J.P. Grotzinger, S. Gupta, N. Lanza, S. LeMouelic, S. Maurice, S.M. McLennan, P.-Y. Meslin, M. Nachon, H. Newsom, V. Payre, W. Rapin, M. Rice, V .Sautter, A.H. Treiman (2016), The Potassic Sedimentary Rocks in Gale Crater, Mars, as Seen by ChemCam Onboard *Curiosity*, *J. Geophys. Res.-Planets*, 121(5), 784-804, doi:10.1002/2015JE004987.
16. LASUE, J., S.M. Clegg, O. Forni, A. Cousin, R.C. Wiens, N. Lanza, N. Mangold, L. LeDeit, O. Gasnault, S. Maurice, J.A. Berger, **K. Stack**, D. Blaney, C. Fabre, W. Goetz, J. Johnson, S. Le Mouelic, M. Nachon, V. Payre, W. Rapin, D.Y. Sumner (2016), Observation of > 5 wt % zinc at the Kimberley outcrop, Gale crater, Mars, *J. Geophys. Res.-Planets*, doi:10.1002/2015JE004946.
15. MANGOLD, N., L.M. Thompson, O. Forni, A.J .Williams, C. Fabre, L. LeDeit, R.C. Wiens, R. Williams, R.B. Anderson, D.L. Blaney, F. Calef, A. Cousin, S.M. Clegg, G. Dromart,

- W.E. Dietrich, K.S. Edgett, M.R. Fisk, O. Gasnault, R. Gellert, J.P. Grotzinger, L. Kah, S. Le Mouelic, S.M. McLennan, S. Maurice, P.-Y. Meslin, H.E. Newsom, M.C. Palucis, W. Rapin, V. Sautter, K.L. Siebach, **K. Stack**, D. Sumner, A. Yingst (2016), Composition of conglomerates analyzed by the Curiosity rover: Implications for Gale Crater crust and sediment sources, *J. Geophys. Res.-Planets*, doi:10.1002/2015JE004977.
14. GROTZINGER, J.P., S. Gupta, M.C. Malin, D.M. Rubin, J. Schieber, K. Siebach, D.Y. Sumner, **K.M. Stack**, A.R. Vasavada, R.E. Arvidson, F. Calef III, L. Edgar, W.F. Fischer, J.A. Grant, J. Griffes, L.C. Kah, M.P. Lamb, K.W. Lewis, N. Mangold, M.E. Minnitti, M. Palucis, M. Rice, R.M.E. Williams, R.A. Yingst, D. Blake, D. Blaney, P. Conrad, J. Crisp, W.E. Dietrich, G. Dromart, K.S. Edgett, R.C. Ewing, R. Gellert, J.A. Hurowitz, G. Kocurek, P. Mahaffy, M.J. McBride, S.M. McLennan, M. Mischna, D. Ming, R. Milliken, H. Newsom, D. Oehler, T.J. Parker, D. Vaniman, R.C. Wiens, S.A. Wilson (2015). Deposition, exhumation, and paleoclimate of an ancient lake deposit, Gale Crater, Mars, *Science*, doi:10.1126/science.aac7575.
13. MANGOLD, N., O. Forni, G. Dromart, **K. Stack**, R. Wiens, O. Gasnault, D. Sumner, M. Nachon, P.-Y. Meslin, R. Anderson, B. Barraclough, J. Bell, G. Berger, D. Blaney, J. Bridges, F. Calef, B. Clark, S. Clegg, A. Cousin, L. Edgar, K. Edgett, B. Ehlmann, C. Fabre, M. Fisk, J. Grotzinger, S. Gupta, K. Herkenhoff, J. Horowitz, J. Johnson, L. Kah, N. Lanza, J. Lasue, S. Le Mouelic, R. Leveille, E. Lewin, M.C. Malin, S. McLennan, S. Maurice, N. Melikechi, A. Mezzacappa, R. Milliken, H.E. Newsom, A. Ollila, S. Rowland, V. Sautter, M. Schmidt, S. Schroder, C. d'Uston, D. Vaniman, R. Williams (2015), Chemical variations of Yellowknife Bay Formation sediments analyzed by the Curiosity Rover on Mars, *J. Geophys. Res.*, doi:10.1002/2014JE004681.
12. SIEBACH, K.L., J.P. Grotzinger, L.C. Kah, **K.M. Stack**, M. Malin, R. Leveille, D.Y. Sumner (2014). Subaqueous Shrinkage Cracks in the Sheepbed Mudstone: Implications for Early Fluid Diagenesis, Gale Crater, Mars, *J. Geophys. Res.*, doi:10.1002/2014JE004623.
11. BLANEY, D., R.C. Wiens, S. Maurice, S.M. Clegg, R.A. Anderson, L.C. Kah, S. Le Mouelic, A. Ollila, N. Bridges, R. Tokar, G. Berger, J.C. Bridges, A. Cousin, B. Clark, M.D. Dyar, P.L. King, N. Lanza, N. Mangold, P.-Y. Meslin, H. Newsom, S. Schroder, S. Rowland, J. Johnson, L. Edgar, O. Gasnault, O. Forni, M. Schmidt, W. Goetz, **K. Stack**, D. Sumner, M. Fisk, M.B. Madsen (2014), Chemistry and texture of the rocks at Rocknest, Gale Crater: Evidence for sedimentary origin and diagenetic alteration, *J. Geophys. Res.*, 119(9), 2109-2131, doi:10.1002/2013JE004590.
10. NACHON, M., S.M. Clegg, N. Mangold, S. Schroder, L.C. Kah, G. Dromart, A.M. Olilla, J.R. Johnson, D. Oehler, J.C. Bridges, S. Le Mouelic, O. Forni, R.C. Wiens, R.B. Anderson, D. Blaney, J.F. Bell III, B.C. Clark, A. Cousin, D.M. Darby, B. Ehlmann, C. Fabre, O. Gasnault, J.P. Grotzinger, J. Lasue, E. Lewin, R. Leveille, S.M. McLennan, S. Maurice, P.-Y. Meslin, M.S. Rice, S.W. Squyres, **K.M. Stack**, D.Y. Sumner, D.T. Vaniman, D. Wellington (2014). Calcium sulfate veins characterized by ChemCam/Curiosity at Gale Crater, Mars, *J. Geophys. Res.*, accepted.
9. LITVAK, M., I.G. Mitrofanov, A.B. Sanin, D. Lisov, A. Behar, W.V. Boynton, L. Deflores, F. Fedosov, D. Golovin, C. Hardgrove, K. Harshman, I. Jun, A.S. Kozyrev, R.O. Kuzmin, A. Malakhov, R. Milliken, M. Mischna, J. Moersch, M. Mokrousov, S. Nikiforov, V.N. Shvetsov, **K. Stack**, R. Starr, C. Tate, V.I. Tret'yakov, A. Vostrukhin, and the MSL Team (2014). Local variations of bulk hydrogen and chlorine content measured at the contact

- between the Sheepbed and Gillespie Lake units in Yellowknife Bay, Gale crater, using the DAN instrument onboard Curiosity, *J. Geophys. Res.*, doi:10.1002/2013JE004556.
8. GROTZINGER, J.P., D.Y. Sumner, L.C. Kah, **K. Stack**, S. Gupta, L. Edgar, D. Rubin, K. Lewis, J. Schieber, N. Mangold, R. Milliken, P.G. Conrad, D. DesMarais, J. Farmer, K. Siebach, F. Calef III, J. Horowitz, S.M. McLennan, D. Ming, D. Vaniman, J. Crisp, A. Vasavada, K.S. Edgett, M. Malin, D. Blake, R. Gellert, P. Mahaffy, R.C. Wiens, S. Maurice, J.A. Grant, S. Wilson, R.C. Anderson, L. Beegle, R. Arvidson, B. Hallet, R.S. Sletten, M. Rice, J. Bell III, J. Griffes, B. Ehlmann, R.B. Anderson, T.F. Bristow, W.E. Dietrich, G. Dromart, J. Eigenbrode, A. Fraemen, C. Hardgrove, K. Herkenhoff, L. Jandura, G. Kocurek, S. Lee, L.A. Leshin, R. Leveille, D. Limonadi, J. Maki, S. McCloskey, M. Meyer, M. Minitti, H. Newsom, D. Oehler, A. Okon, M. Palucis, T. Parker, S. Rowland, M. Schmidt, S. Squyres, A. Steele, E. Stolper, R. Summons, A. Treiman, R. Williams, A. Yingst, MSL Science Team (2014). A Habitable Fluvio-Lacustrine Environment at Yellowknife Bay, Gale Crater, Mars, *Science*, doi: 10.1126/science.1242777.
  7. MCLENNAN, S.M., R.B. Anderson, J.F. Bell III, J.C. Bridges, F. Calef III, J.L. Campbell, B.C. Clark, S. Clegg, P. Conrad, A. Cousin, D.J. DesMarais, G. Dromart, M.D. Dyar, L.A. Edgar, B.L. Ehlmann, C. Fabre, O. Forni, O. Gasnault, R. Gellert, S. Gordon, J.A. Grant, J.P. Grotzinger, S. Gupta, K.E. Herkenhoff, J.A. Horowitz, P.L. King, S. Le Mouelic, L.A. Leshin, R. Leveille, K.W. Lewis, N. Mangold, S. Maurice, D.W. Ming, R.V. Morris, M. Nachon, H.E. Newsom, A.M. Ollila, G.M. Perrett, M.S. Rice, M.E. Schmidt, S.P. Schwenzer, **K. Stack**, E.M. Stolper, D.Y. Sumner, A.H. Treiman, S. VanBommel, D.T. Vaniman, A. Vasavada, R.C. Wiens, R.A. Yingst, MSL Science Team (2014). Elemental Geochemistry of Sedimentary Rocks in Yellowknife Bay, Gale Crater, Mars, *Science*, doi: 10.1126/science.1244734.
  6. VANIMAN, D.T., D.L. Bish, D.W. Ming, T.F. Bristow, R.V. Morris, D.F. Blake, S.J. Chipera, S.M. Morrison, A.H. Treiman, E.B. Rampe, M. Rice, C.N. Achilles, J.P. Grotzinger, S.M. McLennan, J. Williams, J.F. Bell III, H.E. Newsom, R.T. Downs, S. Maurice, P. Sarrazin, A.S. Yen, J.M. Morookian, J.D. Farmer, **K. Stack**, R.E. Milliken, B.L. Ehlmann, D.Y. Sumner, G. Berger, J.A. Crisp, J.A. Horowitz, R. Anderson, D.J. Des Marais, E.M. Stolper, K.S. Edgett, S. Gupta, N. Spanovich, MSL Science Team (2014). Mineralogy of a Mudstone on Mars, *Science*, doi: 10.1126/science.1243480.
  5. WILLIAMS, R.M.E., J.P. Grotzinger, W.E. Dietrich, S. Gupta, D.Y. Sumner, R.C. Wiens, N. Mangold, M.C. Malin, K.S. Edgett, S. Maurice, O. Forni, O. Gasnault, A. Ollila, H.E. Newsom, G. Dromart, M.C. Palucis, R.A. Yingst, R.B. Anderson, K.E. Herkenhoff, S. Le Mouelic, W. Goetz, M.B. Madsen, A. Koefoed, J.K. Jensen, J.C. Bridges, S.P. Schwenzer, K.W. Lewis, **K.M. Stack**, D. Rubin, L.C. Kah, J.F. Bell III, J.D. Farmer, R. Sullivan, T. Van Beek, D.L. Blaney, O. Pariser, R.G. Deen, MSL Science Team (2013). Martian Fluvial Conglomerates at Gale Crater, *Science*, 340(6136), 1068-1072.
  4. SCHMIDT, M., J.L. Campbell, R. Gellert, G.M. Perrett, A.H. Treiman, D.L. Blaney, A. Olilla, F.J. Calef III, L. Edgar, B.E. Elliott, J. Grotzinger, J. Horowitz, P.L. King, M.E. Minitti, V. Sautter, **K. Stack**, J.A. Berger, J.C. Bridges, B.L. Ehlmann, O. Forni, L.A. Leshin, K.W. Lewis, S.M. McLennan, D.W. Ming, H. Newsom, I. Pradler, S.W. Squyres, E.M. Stolper, L. Thompson, S. VanBommel, R.C. Wiens (2013). Volatile element enrichment and geochemical diversity in rocks examined by the MSL Alpha Particle X-Ray Spectrometer (APXS) along Bradbury Rise, Gale Crater, *J. Geophys. Res.*, doi: 10.1002/2013JE004481.

3. FRAEMAN, A.A., R.E. Arvidson, J.G. Catalano, J.P. Grotzinger, R.V. Morris, S.L. Murchie, **K.M. Stack**, D.C. Humm, J.A. McGovern, F.P. Seelos, K.D. Seelos, C.E. Viviano (2013). Detection and Mapping of a Hematite Capping Ridge in Gale Crater, Mars and Implications for Past Aqueous Conditions, *Geology*, doi:10.1130/G34613.1.
2. CREVELING, J.R., D. Fernandez-Remolar, M. Rodgriguez-Martinez, S. Menendez, K.D. Bergmann, B.C. Gill, J. Abelson, R. Amils, B.L. Ehlmann, D.C. Garcia-Bellido, J.P. Grotzinger, C. Hallmann, **K.M. Stack**, A.H. Knoll (2013). Geobiology of a Lower Cambrian carbonate platform, Pedroche Formation, Ossa Morena Zone, Spain., *Palaeo-3*, 386, 459-478.
1. BEYER, R., **K. Stack**, J.L. Griffes, R.E. Milliken, K.E. Herkenhoff, S. Byrne, J.W. Holt, J.P. Grotzinger (2011). An atlas of Mars sedimentary rocks as seen by HiRISE, *Sedimentary Geology of Mars*, eds. JP Grotzinger and RE Milliken, *SEPM Special Publication No. 102*.

**FIRST-AUTHOR or STUDENT/POST-DOC CONFERENCE PRESENTATIONS**  
(underlined = student or post-doc under direct supervision of K. Stack Morgan)

**2018**

- STACK, K.M., R.M.E. Williams, J.P. Grotzinger, D.M. Rubin, J. Frydenvang, C.H. Steeger, “Sandstones and conglomerates at the foothills of Mount Sharp: Gale crater, Mars: Facies analysis and stratigraphic implications,” LPSC 49, The Woodlands, Texas, March 19-23, Abstract #1712 (Talk).
- SUN, V.Z., K.M. Stack, M. Nachon, S.S. Johnson, R.E. Krynyak, R.C. Wiens, M.E. Minitti, L.C. Kah, “Late-stage diagenetic concretions in the lacustrine Murray formation, Gale crater, Mars” GSA Rocky Mountain/Cordilleran Joint Section Meeting, Flagstaff, AZ, May 15-17, Abstract #313603 (Talk).
- SUN, V.Z. and K.M. Stack, “Geomorphic mapping of the basement unit within the Northeast Syrtis Mars 2020 Landing Ellipse,” GSA Rocky Mountain/Cordilleran Joint Section Meeting, Flagstaff, AZ, May 15-17, Abstract #313607 (Poster).
- SUN, V.Z., K.M. Stack, M. Nachon, S.S. Johnson, R.E. Krynyak, R.C. Wiens, M.E. Minitti, L.C. Kah, “Late-stage diagenesis in the Murray formation, Gale crater, Mars: Evidence from diverse concretion morphologies,” LPSC 49, The Woodlands, Texas, March 19-23, Abstract #1587 (Talk).
- SUN, V.Z. and K.M. Stack, “Geomorphic mapping of the basement unit within the Northeast Syrtis Mars 2020 Landing Ellipse,” LPSC 49, The Woodlands, Texas, March 19-23, Abstract #2179 (Poster).
- COFIELD, S. and K.M. Stack, “Geologic mapping and stratigraphic analysis of a candidate Mars 2020 landing site: Jezero crater, Mars,” LPSC 49, The Woodlands, Texas, March 19-23, Abstract #2179 (Poster).

**2017**

- STACK, K.M., L.A. Edgar, K.S. Edgett, C.M. Fedo, J.P. Grotzinger, S. Gupta, C.H. House, J.A. Horowitz, L.C. Kah, E.B. Rampe, D.M. Rubin, J. Schieber, N.T. Stein, D.Y. Sumner, “The Murray Formation of Lower Mount Sharp, Gale Crater, Mars: A Record of an Ancient Evolving Lacustrine System Explored by the MSL Curiosity Rover,” International Meeting of Sedimentology, October 10-12, Toulouse France (Invited Talk).

STACK, K.M., S.M. Cofield, A.A. Fraeman, "Geologic Map of the MSL Curiosity Rover Extended Mission Traverse of Aeolis Mons, Gale Crater, Mars," LPSC 48, The Woodlands, Texas, March 20-24, Abstract #1889 (Poster).

STACK, K.M., J. Rabinovitch, M.A. Bullock, "Characterization of Safe Landing Sites on Venus Using Venera Panoramas and Magellan Radar Properties," LPSC 48, The Woodlands, Texas, March 20-24, Abstract #1891 (Poster).

COFIELD S., K.M. Stack, A.A. Fraeman, "Geologic Mapping and Stratigraphic Analysis of the "Clay Trough" of Mount Sharp, Gale Crater, Mars," LPSC 48, The Woodlands, Texas, March 20-24, Abstract #2531 (Talk).

COFIELD S.M., K.M. Stack, "Geologic Mapping and Stratigraphic Analysis of a Candidate Mars 2020 Landing Site: Jezero Crater, Mars," GSA Annual Meeting, Seattle, Washington, October 22-25, Paper No. 319-8 (Talk).

## 2016

STACK, K.M., J.P. Grotzinger, K.S. Edgett, S. Gupta, L.C. Kah, M.P. Lamb, K.W. Lewis, D.M. Rubin, J. Schieber, D.Y. Sumner, "Facies analysis and stratigraphic context of the Pahrump Hills outcrop, type locality of the basal Murray formation, Gale crater, Mars," 2016 GSA Annual Meeting, Denver, Colorado, September 24-28, Paper #20-9 (Talk).

STACK, K.M., S.M. Cofield, A.A. Fraeman, C.S. Edwards, "Geologic map of the MSL Curiosity rover extended mission traverse of Aeolis Mons, Gale Crater Mars," 2016 GSA Annual Meeting, Denver, Colorado, September 24-28, Paper #80-6 (Poster).

## 2015

STACK, K.M. and J.P. Grotzinger, "Constraining the Timing and Duration of an Ancient Fluvio-Lacustrine System in Gale Crater Using MSL Curiosity Rover Observations," LPSC 46, The Woodlands, Texas, March 16-20, 2015, Abstract #2012 (Invited Talk).

STACK, K.M., J.P. Grotzinger, S. Gupta, L.C. Kah, K.W. Lewis, M.J. McBride, M.E. Minitti, D.M. Rubin, J. Schieber, D.Y. Sumner, L.M. Thompson, J. Van Beek, A.R. Vasavada, R.A. Yingst, "Sedimentology and Stratigraphy of the Pahrump Hills Outcrop, Lower Mount Sharp, Gale Crater, Mars," LPSC 46, The Woodlands, Texas, March 16-20, 2015, Abstract #1994 (Talk).

## 2014

STACK, K.M., J.P. Grotzinger, D.Y. Sumner, F. Calef, L. Edgar, S. Gupta, K. Lewis, M. Rice, D. Rubin, R.M.E. Williams, "Synthesizing MSL Curiosity Rover Observations and Orbital Geologic Mapping to Build a Regional Stratigraphy for Aeolis Palus, Gale Crater," 126<sup>th</sup> Annual Meeting of the Geological Society of America, Vancouver, British Columbia, October 19-22, 2014, Paper #202-4 (Talk).

STACK, K.M., J.P. Grotzinger, R.E. Milliken, R.N. Farley, "Global Distribution of Stratified Deposits on Mars," Eighth International Conference on Mars, Pasadena, California, July 14-18, 2014, Abstract #1192 (Talk).

## 2013

STACK, K.M. and the MSL Science Team, "An Overview of Past Depositional Environments Explored by the Curiosity Rover at Bradbury Landing and Yellowknife Bay, Gale crater,

- Mars," 125<sup>th</sup> Annual Meeting of the Geological Society of America, Denver, Colorado, October 27-31, 2013, Paper #6-4 (Invited Talk).
- STACK, K.M., J. Grotzinger, L. Kah, D. Sumner, L. Edgar, M. Rice, D. Oehler, A. Fairen, K. Siebach, and the MSL Science Team, "The distribution and origin of nodules and minibowls within the Sheepbed member: Implications for early diagenesis in Yellowknife Bay, Gale Crater, Mars," 125<sup>th</sup> Annual Meeting of the Geological Society of America, Denver, Colorado, October 27-31, 2013, Abstract #227794 (Poster).
- STACK, K.M., J.P. Grotzinger, J.L. Griffes, R.N. Farley, "Global Distribution of Layered Deposits on Mars," STRATI 2013: 1<sup>st</sup> International Congress on Stratigraphy, Lisbon, Portugal, July 1-7, 2013, Abstract #180 (Talk).
- STACK, K.M., J.P. Grotzinger, D.Y. Sumner, B.L. Ehlmann, R.E. Milliken, J.L. Eigenbrode, S. Gupta, R.M.E. Williams, L.C. Kah, K.W. Lewis, and the MSL Team, "Using outcrop exposures on the road to Yellowknife Bay to build a stratigraphic column, Gale Crater, Mars." LPSC 44, The Woodlands, Texas, March 18-22, 2013, Abstract #1431 (Talk)

## **2011**

- STACK, K.M. and R.E. Milliken. "Reflectance Spectroscopy of Clay-Sulfate Mixtures: Implications for quantifying hydrated minerals and determining depositional environments on Mars." LPSC 42, The Woodlands, Texas, March 7-11, 2011, Abstract #2024 (Poster)
- STACK, K.M. and J.P. Grotzinger, "Beds, bed thickness, and bed thickness distributions on Mars: An orbital perspective. HiRISE Team Meeting, Flagstaff, Arizona, August 16-18, 2011 (Talk)

## **2010**

- STACK, K.M., J.P. Grotzinger, R.E. Milliken. "Statistical analysis of bed thickness distributions in layered deposits on Mars." First International Conference on Mars Sedimentology and Stratigraphy, El Paso, Texas, April 19-21, 2010, Abstract #6013 (Poster)
- STACK, K.M., M. Lamb, R.E. Milliken, S. Leprince, J.P. Grotzinger, "Movement and grain size distribution of Bahamian sand shoals from remote sensing." KISS Workshop- Monitoring Earth Surface Changes from Space II, March 29-31, 2010 (Talk)

## **INVITED LECTURES**

- 2018 Judd H. and Cynthia S. Oualline Centennial Lecturer in Geological Sciences, Jackson School of Geosciences, University of Texas Austin, Austin, TX, February 22.
- 2018 University of Texas Institute for Geophysics (UTIG) Brown Bag Seminar Series, Jackson School of Geosciences, University of Texas Austin, Austin, TX, February 21.
- 2016 Mars Forum, Jet Propulsion Laboratory
- 2015 NASA Young Professional Science and Engineering Web Talk Series
- 2015 Keynote Speaker, Next Generation Flight Computing Workshop, Sandia National Labs
- 2015 Keynote Speaker, Chevron Decision Review Board Annual Meeting, JPL
- 2014 Keynote Speaker, Chevron Fellows Workshop, Pasadena, CA
- 2014 Keynote Speaker, Chevron Reservoir Management Forum, Chevron Corporation, Bakersfield, CA

## **PROFESSIONAL SERVICE**

- 2015-present Review Panel Member for NASA Mars Data Analysis Program; External Reviewer for NASA Mars Data Analysis Program, Planetary Data Archiving, Restoration, and Tools, Lunar Data Analysis Program
- 2014-present Reviewer for Nature Geosciences, Journal of Geophysical Research, Icarus, Geophysical Research Letters, Marine Geology, Geologos, Planetary and Space Science
- 2015 Session convener, GSA

## **UNIVERSITY AND JPL COMMITTEES**

- 2017 JPL Hiring Committee, Planetary Science: Mars
- 2013-2014 Cabinet member, Caltech Identity Project

## **ADVISING**

### **Postdoctoral Scholars:**

- 2017-present Vivian Sun (Ph.D. Brown '17)

### **JPL Summer Interns:**

- 2016-2017 Shannon Cofield (Ph.D. Old Dominion University expected '19)

## **TEACHING EXPERIENCE**

- 2018 Guest Lecturer for NASA Endeavor STEM Teaching Certificate Project, March 14
- 2013 Graduate Teaching Assistant for Sedimentology, Caltech
- 2013 Graduate Teaching Assistant for Igneous and Metamorphic Petrography, Caltech
- 2012 Graduate Teaching Assistant for Advanced Field and Structural Geology, Caltech
- 2011 Graduate Teaching Assistant for Igneous and Metamorphic Petrography, Caltech
- 2010 Graduate Teaching Assistant for Advanced Field and Structural Geology, Caltech
- 2008 Undergraduate Teaching Assistant for Mineralogy, Williams College
- 2007 Undergraduate Teaching Assistant for Mineralogy, Williams College
- 2007 Undergraduate Teaching Assistant for Global Warming and Natural Disasters, Williams College
- 2005 Undergraduate Teaching Assistant for Introduction to Astronomy, Williams College

## **COMMUNITY OUTREACH**

- 2017 Guest Presenter for 7-12<sup>th</sup> graders, Gulf Coast Exploreum Science Center of Mobile, Mobile, AL

2015	Contributor to Curiosity's 3 Years on Mars Reddit AMA
2014	Volunteer, JPL Open House
2014	Presenter, Science Saturdays, Caltech
2012-2014	Student consultant and representative, Caltech Alumni Association
2011	Volunteer, NASA Spacefest, California Science Center
2010	Organizer, Caltech Geoclub Seminar Series
2010	Presenter, Pasadena Unified School District Middle School Science Day
2010	Guest Presenter for 6 <sup>th</sup> -8 <sup>th</sup> graders, Averson Charter School
2006	Planetarium Presenter, Hopkins Observatory, Williams College

## **PROFESSIONAL ASSOCIATIONS**

2007-present Geological Society of America